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10/730,866	12/09/2003	Daniel J. Cosgrove	P04665US02	3290

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DES MOINES, IA 50309-2721

EXAMINER
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CHOWDHURY, IQBAL HOSSAIN

ART UNIT	PAPER NUMBER
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1652

MAIL DATE	DELIVERY MODE
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10/30/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

Application No.

10/730,866

Applicant(s)

COSGROVE, DANIEL J.

Examiner

Iqbal H. Chowdhury, Ph.D.

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 06 February 2007.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-36 and 38-40 is/are pending in the application.
- 4a) Of the above claim(s) 29-34 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-28, 35-36, 38-40 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_

- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION*****Application Status***

In response to a previous Office action, a non-final action (mailed on August 1, 2006), Applicants filed a response and amendment received on February 6, 2007, amending claims 1-15, 19, 22-25, 28, 35, and 39-40, and canceling claim 37 is acknowledged. Claims 29-34 remain withdrawn as they are directed to non-elected inventions. Claims 1-28, 35-36, 38-40 are pending in the instant Office action and will be examined herein.

Applicants' arguments filed on February 6, 2007, have been fully considered and are deemed to be persuasive to overcome some of the rejections previously applied. Rejections and/or objections not reiterated from previous office actions are hereby withdrawn.

***Non-compliance of Sequence Rule***

Applicant is required to comply with the sequence rules by inserting the sequence identification numbers of all sequences recited within the claims and/or specification. It is particularly noted that claims 1, 3, 5, 8, 15, 24-28, and 38 recite motifs comprising more than 4 amino acid residues. Similarly, Claims 5, 8, 15, 17, 24-28 and 35 recites the amino acid sequence of alpha expansin protein in corresponding figure recited in said claims without a corresponding sequence identifier recited. In addition, drawings submitted on 12/9/2003 are objected to by the Examiner for the recitation of the protein sequences without appropriate sequence identifiers i.e. SEQ ID NOs. See particularly 37 CFR 1.821(d).

***Claim Objections***

Claims 24-25 are objected to as encompassing non-elected subject matter. Appropriate correction is required.

Claim 6 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Claim 6 is not further limiting of claim 5. Appropriate corrections are required.

Claim 16 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Claim 16 is not further limiting of claim 15. Appropriate corrections are required.

Claim 9 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Claim 9 is not further limiting of claim 5. Appropriate corrections are required.

Claim 27 is objected to in the recitation "protein having a property" should be "protein has a property". Appropriate correction is required.

***New-Claim Rejections - 35 U.S.C. § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

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The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

Claims 35-36, and 38 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite and vague for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In the present instance, claim 35 recites, "similarity with by BLAST" which is unclear. It is suggested to change the phrase as to "similarity by BLAST".

Claims 1-4 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claims 1-4 recite "functional characteristics of beta-expansin such as" renders the claim(s) indefinite because the claim(s) include(s) elements not actually disclosed (those encompassed by " functional characteristics of beta-expansin such as"), thereby rendering the scope of the claim(s) unascertainable.

Claims 7-9 and 17-18 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claims 7-9 and 17-18 recite "The protein of claim 5, further comprising an amino acid alignment of a Thr Trp Tyr Gly motif" is grammatically incorrect, which should be "The protein of claim 5, further comprising a Thr Trp Tyr Gly motif".

Claims 10 and 19 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claims 10 and 19 recite "comprising an amino acid sequence of SEQ ID NO: 10", which is not clear to the Examiner because "an amino acid sequence of SEQ ID

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NO: 10 could be interpreted as including fragments of SEQ ID NO: 10. It is suggested to change the phrase as to "comprising the amino acid sequence of SEQ ID NO: 10."

Claims 24-25 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite and vague for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In the present instance, claims 24-25 recite, "is determined" which is unclear. It is suggested to change the phrase as to "as determined".

Claim 40 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite and vague for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In the present instance, claim 40 recites, "comprising an amino acid sequence of SEQ ID NO: 10", which is not clear to the Examiner because "an amino acid sequence of SEQ ID NO: 10 could be interpreted as including fragments of SEQ ID NO: 10. It is suggested to change the phrase as to "comprising the amino acid sequence of SEQ ID NO: 10."

Claims 5 and 15 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite and vague for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In the present instance, claims 5 and 15 recite, "a beta-expansin protein structurally and functionally related to an alpha expansin (part a)" and "a 25% or less sequence similarity --- to an alpha expansin", which is unclear to the Examiner. How a beta expansin polypeptide can be structurally and functionally related to an alpha expansin (part a) and having 25% or less sequence similarity --- to an alpha expansin (part d) simultaneously?

Claims 35 and 36 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite and vague for failing to particularly point out and distinctly claim the subject matter which applicant

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regards as the invention. Claims 35 ((part b-e) are method steps. How can method steps be part of a composition?

Claim 38 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite and vague for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In the present instance, claim 38 recites, "The amino acid sequence protein as in claim 35 having " which is unclear because it does not make any sense, since claim 35 upon which claim 38 depends is directed to a composition. It is suggested to change the phrase as to "The composition of claim 35, wherein the protein has".

***Maintained Claim Rejections - 35 U.S.C. § 112(2<sup>nd</sup>)***

Previous rejection of Claims 13, 22, 28 and 35 under 35 U.S.C. 112, second paragraph, in the recitation of "vegetative homologue" as being indefinite and vague for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention is maintained.

Applicants argue that applicants are permitted to be their own lexicographer and can define their invention using any phrases. This is true, however, the specification does not have any definition for "vegetative homologue" and it is unclear as to how similar the particular type of plant is to the related plant.

***Maintained-Claim Rejections - 35 USC § 112***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it

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pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Previous rejection of Claims 1-9, 11-18, 20-22, 24-28 and 35-39 under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement is maintained. Claims 1-5, 7-9, 15, 17-18, 24-28 and 35-39 are directed to a genus of a beta-expansins comprising some specific motifs, 25% or less sequence similarity with an alpha-expansin protein, a conserved motif of His-Phe-Asp-Leu-Ser-Gly or Gly Gly Ala Cys Gly in amino acid sequence of seven beta-expansin proteins, which is present in plant cell walls having function of expansion or stress relaxation on grass cell walls as determined by cell wall extension and/or stress relaxation assays.

Applicants argue that applicants "are not required to disclose every species encompassed by their claims even in an unpredictable art" and description of a representative number of species does not require the description to be of such specificity that it would provide individual support for each species that the genus embraces, and applicants further argue that it is thus not necessary that the specification describe each individual species embraced by a genus claim. Applicants also argue that the written description requirement may be met by "showing that an invention is complete by disclosure of sufficiently detailed, relevant identifying characteristics, i.e., complete or partial structure, other physical and or chemical properties, functional characteristics when coupled with a known or disclosed correlation between function and structure, or some combination of such characteristics." *Enzo Biochem, Inc. v. Gen-Probe Inc.*, 63 U.S.P.Q.2d 1609, 1613 (Fed. Cir. 2002). Applicants further argue that applicants' disclosure meets this requirement i.e. the specification describes beta expansins with specific chemical properties, "inducing expansion or stress relaxation of monocot cell walls more effectively than



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on dicotyledons cell walls as determined using cell wall extension and/or stress relaxation assays", and common attributes of a specific structural motif of either a HFDLSG, TWYG, GGACG, or HFD motif. Applicants furthermore, argue that the beta expansins contain two subgroups, those expressed in pollen and those expressed in vegetative tissue in plants and the applicants have provided 4 representative species for grass pollen allergens and 3 representative species for the vegetative homologs of the grass pollen allergens all of which contain the HFDLSG, TWYG, GGACG, or HFD motifs and Figures 4-6 and their sequences aligned in a multiple sequence alignment also shows representative species and thus the genera is very well characterized and one skilled in the art would be able to easily identify and test species belonging to the beta expansin genus for these properties.

Applicant's arguments and amendments to claims have been fully considered but are not deemed to be persuasive to overcome the rejection on Written description issues.

Examiner acknowledges amendment to claims, however the amendment does not give enough structural feature of any beta-expansins comprising some specific motifs, 25% or less sequence similarity with an alpha-expansin, a conserved motif of His-Phe-Asp-Leu-Ser-Gly or Gly Gly Ala Cys Gly in amino acid sequence of seven beta-expansin proteins, which is present in plant cell walls having function of expansion or stress relaxation on grass cell walls as determined by cell wall expansion and/or stress relaxation assays, that is required for fulfilling Written description requirements. Although, the specification provides some identifying characteristics such as motifs or cell wall expansion or stress relaxation of monocot cells, however, none of these characteristics is sufficient to change the fact that the claims include beta-expansin proteins which are highly variable in structure as all of these characteristics can be

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present in many beta-expansin proteins and neither genus recites enough characteristics that a skilled artisan would reasonably expect that any beta-expansin protein having these characteristics would necessarily be highly structurally similar to the disclosed species. As discussed in the written description guidelines the written description requirement for a claimed genus may be satisfied through sufficient description of a representative number of species by actual reduction to practice, reduction to drawings, or by disclosure of relevant, identifying characteristics, i.e., structure or other physical and/or chemical properties, by functional characteristics coupled with a known or disclosed correlation between function and structure, or by a combination of such identifying characteristics, sufficient to show the applicant was in possession of the claimed genus. A representative number of species means that the species, which are adequately described are representative of the entire genus. **Thus, when there is substantial variation within the genus, one must describe a sufficient structure and variety of species to reflect the representative structure variation within the genus.** Satisfactory disclosure of a representative structure and number depends on whether one of skill in the art would recognize that the applicant was in possession of the necessary common attributes or features of the elements possessed by the members of the genus in view of species disclosed. For inventions in an unpredictable art, adequate written description of a genus, cannot be achieved by disclosing the structure of small portion of only one species within the genus. The genus of polypeptide having activity of inducing cell wall expansion or stress relaxation of monocot cells is structurally diverse as it broadly encompasses many mutants and variants having cell wall expansion and stress relaxation activity having different structures. As such, the disclosure solely of functional features coupled with minor structural feature (motifs) that may or may not present

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in all members of the genus is insufficient to be representative of the attributes and features of the entire genus. Therefore, the rejection is maintained.

***Maintained - Claim Rejections - 35 U.S.C. § 112***

Previous rejection of Claims 1-9, 11-18, 20-22, 24-25, 26-28 and 35-39 under 35 U.S.C. 112, first paragraph, enablement requirement, is maintained. This rejection has been described in length in previous Office Action. The rejection is maintained for the following reasons.

The specification, while being enabling for a beta-expansin of SEQ ID NO: 10 from *Oryza sativa* (rice) comprising some specific motifs, 25% or less sequence similarity with an alpha-expansin, a conserved motif of His-Phe-Asp-Leu-Ser-Gly or Gly Gly Ala Cys Gly in amino acid sequence of seven beta-expansin proteins, does not reasonably provide enablement for any beta-expansin. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the invention commensurate in scope with these claims.

Applicants argue that one skilled in the art would be able to make and use the present invention and the scope of the claims is commensurate in scope with the instant specification. Applicants also argue that the present invention does not require undue experimentation to practice the claimed invention and further argue that a considerable amount of experimentation is permissible if it is merely routine. Applicants further argue that the knowledge for identifying and isolating other beta expansins from libraries or databases is routine as is the recombinant molecular technology for making mutations, insertions or deletions of amino acids of beta expansin sequences, wherein the variants can be tested using

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the cell wall expansion or cell relaxation assays described in the specification or other assays known in the art to determine the ability of the beta expansin variants to loosen or expand cell walls, in particular their activity on loosening or expanding monocot or dicot cell walls. Furthermore, applicants argue that while it is true that changing specific amino acids at enzymatic sites may affect protein function, it is common practice in the art to modify proteins in ways that have no effect on protein function, for example, targeting non conserved regions of the protein or making conserved amino acid substitutions and one skilled in the art can test this hypothesis using natural variants or site-directed mutagenesis, and the beta expansins may often have large homology with respect to one another ranging from about 28% to about 60% but as discovered by the Applicants still conserve these motifs and the ability to induce expansion or stress relaxation of monocot cell walls more effectively than dicotyledons cell walls as determined using cell wall extension and/or stress relaxation assays.

Applicant's arguments have been fully considered but are not deemed persuasive to overcome the rejection on enablement issues. The examiner acknowledges the amendment to the claims and a journal article but disagrees with the applicant's contention that the claimed invention is adequately enabled.

Claims are so broad as to encompass any beta-expansin comprising some specific motifs, 25% or less sequence similarity with an alpha-expansin, a conserved motif of His-Phe-Asp-Leu-Ser-Gly or Gly Gly Ala Cys Gly in amino acid sequence of seven beta-expansin proteins, which is present in plant cell walls having function of expansion or stress relaxation on monocot cell walls as determined by cell wall expansion and/or stress relaxation assays.

The scope of the claim is very broad in the context of any beta-expansin from any source or any beta-expansin having some motif, which are 25% or less similarity to alpha expansin having function of expansion or stress relaxation on monocot cell walls, which encompasses many mutants and variants i.e. there is no structural feature of the claimed genus, which is representative of all the members of the any beta-expansin from any source or any beta-expansin having some motif, which are 25% or less similarity to alpha expansin having function of expansion or stress relaxation on monocot cell walls recited in the claim. The specification discloses few representative species of said genus, which is insufficient to adequately enable the required genus of any beta-expansin from any source or any beta-expansin having some motif, which are 25% or less similarity to alpha expansin having these specific functional characteristics. Claims still read on any beta-expansin from any source or any beta-expansin having some motif, which are 25% or less similarity to alpha expansin and to practice the claimed invention without structural feature of the claimed genus, one of ordinary skill in the art would require undue experimentation.

The specification does not support the broad scope of the claims which encompass any beta-expansin from any source having some common motifs because the specification does **not** establish: (A) regions of the protein structure which may be modified without affecting beta-expansin activity; (B) the general tolerance of beta-expansin to modification and extent of such tolerance; (C) a rational and predictable scheme for modifying any beta-expansin residues with an expectation of obtaining the desired biological function; and (D) the specification provides insufficient guidance as to which of the essentially infinite possible choices is likely to be successful.

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Thus, applicants have not provided sufficient guidance to enable one of ordinary skill in the art to make and use the claimed invention in a manner reasonably correlated with the scope of the claims broadly including any beta-expansin from any source. The scope of the claims must bear a reasonable correlation with the scope of enablement (In re Fisher, 166 USPQ 19 24 (CCPA 1970)). Without sufficient guidance, determination of any beta-expansin or any fragment thereof having the desired biological characteristics is unpredictable and the experimentation left to those skilled in the art is unnecessarily, and improperly, extensive and undue. See In re Wands 858 F.2d 731, 8 USPQ2nd 1400 (Fed. Cir, 1988). Therefore, the rejection is maintained.

***Maintained-Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Previous rejection of Claims 1-28, and 35-40 under 35 U.S.C. 102(b) as being anticipated by UniProt Accession No. O24230\_Orysa, created 1/1/1998) and Cosgrove et al. (Group I allergens of grass pollen as cell wall-loosening agents, Proc Natl Acad Sci U S A. 1997 Jun 10; 94(12): 6559-64, see IDS) is maintained. Applicants argue that the reference cited by the examiner is not by another, which is their own work and submitted a declaration under 37 CFR 1.132 by explaining that the coauthors were not involve in the inventive contribution to the invention. Applicant's arguments have been considered but are not deemed persuasive to over

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come the rejection. In the declaration, applicants do not state that the co-authors worked under the direction and supervision of the applicants but rather state that they were not involved in the invention recited in the instant application. Furthermore, the declaration does not explain at all what the co-authors contributed to the disclosure of the cited reference, which indicates they might have involved in the work reported. Applicants need to clearly indicate that the co-authors were not involved in main invention, concept but rather in routine work by making clear what each of the co-authors did. In view of the arguments and declaration, the rejection is maintained as discussed.

***Maintained-Claim Rejections - 35 USC § 102***

Previous rejection of Claims 3-4, 15-16, 18, 20-22, 25 and 35-36, 38-39 are rejected under 35 U.S.C. 102(b) as being anticipated by Shcherban et al. (PNAS 1995 Sep 26; 92(20): 9245-9, see IDS) is maintained and claims 1-2, 5-14, 17, 19, 23-24, 26-28 and 40 are included in this rejection. This rejection has been discussed at length in the previous office action. The rejection is maintained for the following reasons.

Applicants argue that the Office Action did not make out a *prima-facie* case of anticipation because the reference does not teach each and every claim element and anticipation requires the disclosure in a single prior art reference of each element of the claim under consideration. Applicants also argue that Claims 3 and 4 recite beta expansin proteins inducing expansion or stress relaxation on grass cell walls more effectively on monocot cell walls than on dicotyledons cell walls as determined by cell wall extension and/or stress relation assays, and Shcherban et al. do not teach each and every element of the claims but rather, they merely state

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that they have identified "a class of wall proteins, called expansins, which have the remarkable ability to promote the extension of isolated plant cell walls." Applicants further argue that the reference does not disclose what group of expansins expand cell walls, for example, alpha or beta expansins, or what kinds of plant cell walls they expand, for example, monocots or dicots, etc. Applicants further argue that Shcherban et al. do not teach that some expansins, in particular 13-expansins, induce expansion of monocot cell walls more effectively than dicot cell walls. Thus, Shcherban et al. do not teach each element of the claims and therefore do not anticipate the claims. Furthermore, applicants argue that Shcherban et al. do not teach that proteins having the amino acid motifs of GGACCG and HFD induce expansion more effectively on monocot cell walls than on dicot cell walls.

Applicant's arguments have been fully considered but are not persuasive to overcome the rejection on anticipation under 35 USC 102 (b) for the following reasons.

Instant claims (including newly added claims) are directed to any beta-expansin comprising some specific motifs, 25% or less sequence similarity with an alpha-expansin, conserved motifs of His-Phe-Asp-Leu-Ser-Gly or Gly Gly Ala Cys Gly or Thr Trp Tyr Gly or His Phe Asp in amino acid sequence of seven beta-expansin proteins, which is present in plant cell walls having function of expansion or stress relaxation on monocot cell walls as determined by cell wall expansion and/or stress relaxation assays.

Shcherban et al. teach the isolation of the expansin from rice, wherein the cDNA encoding the protein, which is 100% identical to SEQ ID NO: 10 of the instant application (see attached sequence alignment). Shcherban et al. also teach molecular cloning and sequence analysis of expansins--a highly conserved, multigene family of proteins that mediate cell wall



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extension in plants, which has the ability to mediate cell wall extension in plants. Shcherban et al. further teach isolation of cDNA clones from cucumber encoding expansins on the basis of peptide sequences of proteins purified from cucumber hypocotyls and teach the expansin cDNAs encode related proteins with signal peptides predicted to direct protein secretion to the cell wall. Shcherban et al. further teach isolation of Arabidopsis and rice (*Oryza sativa*) expansin cDNAs from collections of anonymous cDNAs and indicate at least four distinct expansin cDNAs in rice and at least six in Arabidopsis. Shcherban et al. also teach expansins, which are highly conserved in size and sequence (60-87% amino acid sequence identity and 75-95% similarity between any pairwise comparison with other beta-expansin family proteins), and teach that phylogenetic trees indicate the multigene family formed before the evolutionary divergence of monocotyledons and dicotyledons and a series of highly conserved tryptophan may function in expansin binding to cellulose or other glycans. Shcherban et al. further teach all the motifs recited in the claims, since the amino acid sequence of expansin from rice of Shcherban et al. is the same as of instant application, which 100% identical to each other. The expansin of Shcherban et al. from rice inherently possesses all the characteristics and functions of beta-expansin of the instant application. Therefore, the rejection is maintained.

### *Conclusion*

Claims 1-28, 29-34, 35-36 and 38-40 are pending.

Claims 29-34 are withdrawn.

Claims 1-28, 35-36 and 38-40 are rejected.

No claim is in condition for allowance.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Iqbal Chowdhury, Ph.D. whose telephone number is 571-272-8137. The examiner can normally be reached on 9:00-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ponnathapu Achutamurthy can be reached on 703-272-0928. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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